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REMARKS

By the present amendment, Applicant has amended Claims 1, 8, 9, 11, 12, 18, 19, 21, 24, 28, 29 and 30. Claims 1-30 remain pending in the present application. Claims 1, 11 and 21 are independent claims.

Applicant appreciates the courtesies extended to Applicant's representative during the personal interview held February 2, 2000. The present response summarizes the substance of the interview. At the interview a proposed amendment introducing new Claims 31-47 was presented for discussion. The newly introduced claims set forth a catalytic converter and resonator device for use in an exhaust system of an internal combustion engine. This device being disposed between an exhaust manifold and a muffler or an exhaust tail pipe. The device comprises a canister including an inlet end, a forward portion, a rearward portion and an outlet end, the inlet end adjacent the forward portion, the forward portion adjacent the rearward portion, the rearward adjacent the outlet end, and the inlet end, the forward portion, the rearward portion and the outlet end being aligned along a common longitudinal axis. The forward portion having a forward inner periphery, and the rearward portion having a rearward inner periphery. Within the canister, at least one catalytic converter element disposed within the forward portion thereof. The catalytic converter element has an outer periphery,

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and is formed of a substrate having a plurality of parallel passages, the parallel passages being parallel with the common longitudinal axis, and the substrate being coated with a catalytically reactive member. At least one resonator element disposed in the rearward portion of the canister, each resonator element includes a tubular member having an outer diameter and defining a hollow core. The tubular member has a plurality of sound attenuating perforations radially therethrough. Supporting each resonator element along the common longitudinal axis is at least one plate circumscribing either or both ends of the tubular member. The inner periphery of the rearward portion and the outer diameter of tubular member of each the at least one resonator element defining a sound attenuating plenum therebetween. Arguments were advanced that the disclosure of Wagner et al. fails to anticipate, or render obvious Applicant's presently claimed invention. Specifically, it was pointed out that the disclosure of Wagner et al. was directed to a catalytic converter and muffler combination device for use with diesel internal combustion engines. Although Wagner et al. alludes to the use of the device with gasoline internal combustion engines, this reference is silent as to how to accomplish this. The device in Wagner et al. has an outer casing, a plurality of resonators, a plurality of impermeable flanges, and a catalytic converter element. The arrangement of these components provide a plurality of chambers or plenums, defined by the casing and flanges

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(in pairs) surrounding the plurality of resonators. These plenums allow for the expansion of the exhaust gases and engine noises to enter, forming pressurized "dead-spaces". These dead-spaces utilize the physical phenomenon of harmonic cancellation to attenuate the engine noises. The phenomenon occurs by virtue of the pressurized dead-spaces reflecting the noises trapped therein back onto the subsequent engine exhaust gases and noises. In diesel engines this "so-called" back pressure enhances the engine performance by the virtue of the operation of the diesel engine. Consequently, this type of device would not work well with a standard gasoline engine. In addition, the dead-spaces of Wagner et al. do not allow the exhaust gases to exit the device until the engine has been shut down, removing the source of incoming pressure. Upon the removal of the incoming pressure, the back pressure of the dead-space gases pass back through the resonators in order to escape into the atmosphere. Depending upon the diesel engine fuel by-products found in the exhaust gases, once the incoming pressure is removed the trapped dead-space gases may ignite causing a "back-fire". Such back-fires may cause injury to one of more of the muffler, engine, operator and any other persons nearby.

Applicant's claimed invention operates primarily on gasoline powered engines, although it will work suitably with diesel engines without the nefarious back pressure, and ultimately the injurious backfire. Applicant's claimed invention reduces engine noise as

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well as reduces unacceptable exhaust emissions. Applicant's claimed invention utilizes a flow through resonator in combination with a catalytic converter. Applicant's device may be used in conjunction with or without a "muffler" in the exhaust system of an internal combustion engine. Resonators are not mufflers, in that they do not serve to attenuate or cancel a broad range of exhaust frequencies, but rather reduce or eliminate certain objectionable frequencies or levels which are more difficult to attenuate using a conventional muffler. Applicant's resonator construction does not restrict the flow of exhaust gases in order to generate a back pressure on the incoming exhaust gases. Applicant's claimed invention also does not set dead-spaces within the casing (before or after the catalytic converter) for increasing trap gases. The device set forth in Applicant's claims is structurally and functionally different from that disclosed in the patent to Wagner et al. The Examiner indicated she would reconsider these arguments upon the filing of a formal amendment.

The Examiner objected to the disclosure because of a number of informalities. Applicant has amended the specification to correct the noted informalities and to more particularly describe the present invention. Applicant has also reviewed the disclosure to determine the presence of other minor errors and has made the necessary changes.

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In the recent Office Action the Examiner rejected Claims 1-30 under 35 U.S.C. § 112, second paragraph, as being indefinite. Applicant has amended Claims 1, 8, 9, 11, 12, 18, 19, 21, 24, 28, 29 and 30 to provide antecedent basis for the claim language and to more particularly define the present invention. Applicant respectfully submits that Claims 1-30, as amended, meet the specific requirements of 35 U.S.C. § 112, second paragraph.

Applicant will advance arguments hereinbelow to illustrate the manner in which the presently claimed invention is patentably distinguishable from the cited and applied prior art. Reconsideration of the present application is respectfully requested.

In the recent Office Action the Examiner rejected Claims 1, 2, 4, 6, 9, 21, 24-26 and 29 under 35 U.S.C. § 102(b) as being anticipated by Wagner et al. Claims 3, 5, 7, 8, 10-20, 22, 23, 27, 28, and 30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wagner et al. in view of one or more of Munro, Plemons, Jr., Ignoffo, Harris, Berg et al., Lachman et al., and/or Japanese document no. 64-12017. These grounds of rejection are respectfully traversed.

As set forth at the interview, Applicant's claimed invention is a catalytic converter and sound attenuating resonator combination that is used in an exhaust system of an internal combustion engine, with or without a subsequent muffler device. Resonators are not mufflers, in that they do not serve to attenuate or cancel

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a broad range of exhaust frequencies, but rather reduce or eliminate certain objectionable frequencies or levels which are more difficult to attenuate using a conventional muffler. Applicant's resonator construction does not restrict the flow of exhaust gases in order to generate a back pressure on the incoming exhaust gases. Applicant's claimed invention also does not set dead-spaces within the casing (before or after the catalytic converter) for increasing trap gases.

On the other hand, the catalytic converter and muffler system of Wagner et al. is directed to a catalytic converter and muffler combination device for use diesel internal combustion engines. Eventhough Wagner et al. alludes to the use with gasoline internal combustion engines, Wagner et al. is silent as to how to accomplish this. The device in Wagner et al. has an outer casing, a plurality of resonators, a plurality of impermeable flanges, and a catalytic converter element. The arrangement of these components provide a plurality of chambers or plenums, defined by the casing and flanges (in pairs) surrounding the plurality of resonators. These plenums allow for the expansion of the exhaust gases and engine noises to enter, forming a pressurized "dead-spaces". These dead-spaces utilize the physical phenomenon of harmonic cancellation to attenuate the engine noises. The phenomenon occurs by the virtue of pressurized dead-spaces reflecting the noises trapped therein back onto the subsequent engine exhaust gases and noises. In

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diesel engines this "so-called" back pressure enhances the engine performance by the virtue of the operation of the diesel engine. Consequently, this type of device would not work well with a standard gasoline engine. In addition, the dead-spaces of Wagner et al. do not allow the exhaust gases to exit the device until the engine has been shut down, removing the source of incoming pressure. Upon the removal of the incoming pressure, the back pressure of the dead-space gases pass back through the resonators in order to escape into the atmosphere. Depending upon the diesel engine fuel by-products found in the exhaust gases, once the incoming pressure is removed the trapped dead-space gases may ignite causing a "back-fire". Such back-fires may cause injury to one of more of the muffler, engine, operator and any other persons nearby. Thus, Applicant submits that the patent to Wagner et al. is insufficient as anticipatory reference against the instant claims.

With respect to the rejections under 35 U.S.C. § 103(a), Applicant submits that the plethora of secondary references are insufficient to supplement the apparent deficiencies of the primary reference to Wagner et al. Moreover, there appears no motivation or guidance in the prior art to modify the Wagner et al. muffler in the manner suggested of record by the Examiner. Further, by modifying the muffler disclosed in Wagner et al. as suggested by the Examiner would destroy the functionability and operability of the muffler disclosed in Wagner et al.

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"The mere fact that the prior art may be modified as suggested by the Examiner does not make the modification obvious unless the prior art suggests the desirability of the modification." In re Fritch, 992 F.2d 1260, 23 U.S.P.Q.2d 1730 (Fed. Cir. 1992). Under Section 103(a), there must be some objective teaching in the prior art that would have motivated one of ordinary skill in the art to arrive at the claimed invention as a whole. In re Fine, 5 USPQ2d 1596, 1599-1600 (Fed. Cir. 1988). Applicant respectfully submits that independent Claims 1, 11 and 21, and their respective corresponding dependent Claims 2-10, 12-20 and 22-30 are allowable over the prior art of record.

The Draftsperson's objections to the drawings as filed have been noted. These objections will be taken care of upon the filing of the formal, inked drawing boards, which will be accomplished no later than upon submission of the issue fee.

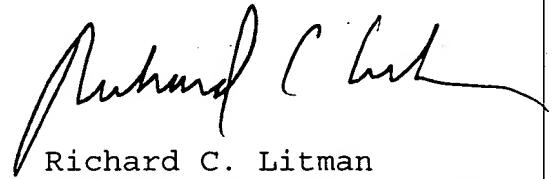
A proposed drawing change is submitted herewith. Proposed changes are shown in red. In each of Figures 1-3, the proposed changes include phantom perforations --54-- in the forward plate 48, 82 and 132.

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For the foregoing reasons, Applicant respectfully submits that the present application is in condition for allowance. If such is not the case, the Examiner is requested to kindly contact the undersigned in an effort to satisfactorily conclude the prosecution of this application.

Respectfully submitted,



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